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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/823,491	03/31/2001	James W. Edwards	042390P10503	6546

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EXAMINER
PYZOCHA, MICHAEL J

ART UNIT	PAPER NUMBER
2137	

DATE MAILED: 03/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/823,491	EDWARDS ET AL.
	Examiner	Art Unit
	Michael Pyzocha	2137

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>*18 January 2005*</u>.

2a)☒ This action is **FINAL.**   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-5,12-14,23-25 and 34-36* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5,12-14,23-25 and 34-36* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date _____.

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

1.   Claims 1-5, 12-14, 23-25 and 34-36 are pending.

2.   Amendment filed 01/18/2005 has been received and

considered.

Claim Rejections - 35 USC § 103

3.   The following is a quotation of 35 U.S.C. 103(a) which

forms the basis for all obviousness rejections set forth in this

Office action:

> (a) A patent may not be obtained though the invention is not identically
> disclosed or described as set forth in section 102 of this title, if the
> differences between the subject matter sought to be patented and the prior
> art are such that the subject matter as a whole would have been obvious at
> the time the invention was made to a person having ordinary skill in the
> art to which said subject matter pertains. Patentability shall not be
> negatived by the manner in which the invention was made.

4.   Claims 1, 12, 23, 34 are rejected under 35 U.S.C. 103(a) as

being unpatentable over Cowan et al (with updates to StackGuard

1.1 on 08 January 2000) and further in view of Koopman.

As per claims 1, 12, 23, and 34, Cowan et al discloses

placing a return address on a stack (see page 7); adding a

plurality of empty spaces to a known place on the stack (see

StackGuard 1.1 page 4 the null canary); executing a called

function (see pages 5-6); find the return address (see page 7).

Cowan et al fails to disclose removing one or more of the plurality of empty spaces from the stack to find the address and setting an end of stack pointer to an end of stack frame.

However, Koopman teaches these removing items from a stack to get to the next piece of data and pointers for the top of the stack (see pages 1-2).

At the time of the invention it would have been obvious to a person of ordinary skill in the art to use Koppman's method of removing data from a stack to remove the random space of Cowen et al.

Motivation to do so would have been to prevent the stack from overflowing (see Koopman Figure 1.1 where after 9 is pushed onto the stack if it is not removed the stack will overflow).

5.   Claims 2-4, 13-14, 24-25, 35-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over the modified Cowen et al and Koopman system as applied to claims 1, 12, 23 and 34 above, and further in view of Kettlewell (webpage).

As per claims 2, 13, 24 and 35, the modified Cowen et al and Koopman system discloses calculating a random number (see Cowen et al page 9); and setting an end of stack pointer to an end of the stack frame (see Koopman page 2 section 1.2.2 paragraph 1) building a stack frame by placing values from the called function onto the stack (see Cowen et al figure 2).

The modified Cowen et al and Koopman system fails to disclose saving said random number in a secure location; placing a plurality of blank bytes equal to the random number onto the stack.

However Kettlewell teaches saving said random number in a secure location; placing a plurality of blank bytes equal to the random number onto the stack (Kettlewell page 3);

At the time of the invention it would have been obvious to a person of ordinary skill in the art to use Kettlewell's method of saving said random number in a secure location; placing a plurality of blank bytes equal to the random number onto the stack in the modified system of Cowen et al and Koopman.

Motivation to do so would have been to deny an attack of knowing were the target address is at (see Kettlewell page 3)

As per claims 3, 14, 25 and 36, the modified Cowen et al, Koopman and Kettlewell system discloses the secure location being a register not generally accessible (see Cowan et al figure 3)

As per claim 4, the modified Cowen et al, Koopman and Kettlewell system discloses the modified return routine comprises: recalling a random number saved during an execution of said modified call routine (see Cowan et al figure 4 line 1 where the canary is the random space of Kettlewell); removing a

number of bytes equal to said random number from the stack (see

Cowan et al figure 4 line 3); retrieving a return address for

the called function from the stack (see Cowan et al page 7 first

paragraph); and setting an end of stack pointer to an end of a

previous stack frame (see Koopman page 2, 1.2.2 paragraph 1).

6.   Claim 5 is rejected under 35 U.S.C. 103(a) as being

unpatentable over the modified Cowen et al and Koopman system as

applied to claim 1 above, and further in view of Menezes et al

(Handbook of Applied Cryptography).

As per claim 5, the modified Cowen et al and Koopman system

discloses building a stack frame by placing values from the

called function onto the stack (see Cowan et al figure 2).

The modified Cowen et al, Koopman and Kettlewell system

fails to disclose calculating a hash value and storing a hash

value of the stack invariants.

However, Menezes et al teaches the use of hash values for

message integrity (see page 323 and it is inherent that the hash

must be done on invariants and that it must be stored in order

to check the integrity).

At the time of the invention it would have been obvious to

a person of ordinary skill in the art to use Menezes et al's

hash function in the modified Cowen et al, Koopman and

Kettlewell system. Motivation to do so would have been to

provide content integrity (see Menezes et al page 323).

Response to Arguments

7.   Applicant's arguments with respect to claims 1-5, 12-14,

23-25 and 34-36 have been considered but are moot in view of the

new ground(s) of rejection.

Conclusion

8.   Applicant's amendment necessitated the new ground(s) of

rejection presented in this Office action. Accordingly, **THIS**

ACTION IS MADE FINAL. See MPEP § 706.07(a). Applicant is

reminded of the extension of time policy as set forth in 37

CFR 1.136(a).

A shortened statutory period for reply to this final action

is set to expire THREE MONTHS from the mailing date of this

action. In the event a first reply is filed within TWO MONTHS

of the mailing date of this final action and the advisory action

is not mailed until after the end of the THREE-MONTH shortened

statutory period, then the shortened statutory period will

expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated

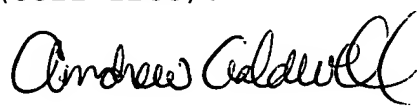from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Pyzocha whose telephone number is (571) 272-3875. The examiner can normally be reached on 7:00am - 4:30pm first Fridays of the bi-week off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Caldwell can be reached on (571) 272-3868. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MJP

ANDREW CALDWELL
SUPERVISORY PATENT EXAMINER